

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
21 May 2004 (21.05.2004)

PCT

(10) International Publication Number
WO 2004/041502 A1

(51) International Patent Classification⁷: B29C 45/16,
45/76

(21) International Application Number:
PCT/US2003/031291

(22) International Filing Date: 3 October 2003 (03.10.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/422,783 31 October 2002 (31.10.2002) US

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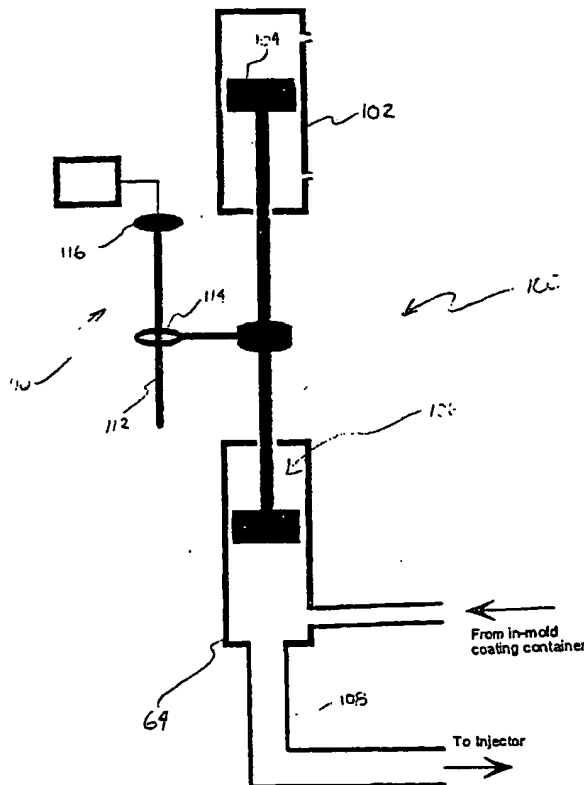
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44333-3300 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU,
AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,
CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR,
KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK,
MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT,
RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR,
TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR METERING AND CONTROLLING DISPENSE RATE



(57) Abstract: A method is provided for metering and controlling the dispense rate of an in-mold coating composition into a mold cavity (16) and onto a thermoplastic molded article contained therein. A heated thermoplastic material is injected into the mold cavity (16). The thermoplastic material is allowed to form a thermoplastic article in the mold cavity (16). An in-mold coating composition is injected into the mold cavity (16) and onto the thermoplastic article. The amount of said in-mold coating composition injected into the mold cavity (16) and onto the article is controlled. The rate that the in-mold coating composition is injected into the mold cavity (16) and onto the in-mold coating article is controlled.

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ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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Published:

— with international search report

INTERNATIONAL SEARCH REPORT

Intern. Application No
PCT/US 03/31291

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B29C45/16 B29C45/76

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 B29C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

PAJ, EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	PATENT ABSTRACTS OF JAPAN vol. 1995, no. 02, 31 March 1995 (1995-03-31) -& JP 06 328504 A (DAINIPPON TORYO CO LTD), 29 November 1994 (1994-11-29) abstract	1-10
A	US 2002/039656 A1 (THOMPSON JOHN A ET AL) 4 April 2002 (2002-04-04) figure 2	1-10
A	PATENT ABSTRACTS OF JAPAN vol. 1996, no. 03, 29 March 1996 (1996-03-29) & JP 07 290504 A (MITSUBISHI GAS CHEM CO INC;OTHERS: 03), 7 November 1995 (1995-11-07) abstract	1-10
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☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

3 February 2004

Date of mailing of the international search report

11/02/2004

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International Application No

PCT/US 03/31291

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>PATENT ABSTRACTS OF JAPAN vol. 2000, no. 08, 6 October 2000 (2000-10-06) & JP 2000 141407 A (DAINIPPON TORYO CO LTD), 23 May 2000 (2000-05-23) abstract</p> <p>-----</p>	1-10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/31291

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
JP 06328504	A	29-11-1994	NONE	
US 2002039656	A1	04-04-2002	US 6617033 B1 WO 03031138 A1 CA 2438672 A1 EP 1299218 A2 WO 0204187 A2 US 2002171171 A1	09-09-2003 17-04-2003 13-07-2003 09-04-2003 17-01-2002 21-11-2002
JP 07290504	A	07-11-1995	JP 3422843 B2	30-06-2003
JP 2000141407	A	23-05-2000	DE 69902701 D1 DE 69902701 T2 EP 0934808 A2 US 6180043 B1	10-10-2002 07-08-2003 11-08-1999 30-01-2001